Minutes from CHPS Forcing Team Call

Wednesday December 3, 2008

Mark Glaudemans, OHD

Participants:

ABRFC –Mike Boehmke, Billy Olsen
CNRFC –Art Henkel, Rob Hartman
NERFC – Jeff Oullett
NWRFC – Don Laurine, Harold Opitz, Ray Fukunaga, Brad Gillies, Joe Intermill
OHD – Mark Glaudemans, Jingtao Deng, Paul Tilles, David Miller, David Kitzmiller

Reference Documents:

SurveySummary12022008.xls - distributed via 12/02 email
SurveySummary12032008.xls **- Updated copy posted with minutes**

Next Call:

Wednesday 12/17/2008 12:00 Eastern **(note: no call 12/10)**
number: 866-614-2988
participant passcode: 7565560

The specific topics discussed at the meeting are summarized below. General discussion within these topics included the role of this team, team goals, and near-term and long-term activities. I will attempt to summarize these general topics in a section at the end of these minutes.

1. Reviewed Updated Forcing-Application Matrix

The spreadsheet/matrix currently shows the application(s) planned for use in generating a given gridded forcing. The matrix was updated before the meeting as follows:

- QTE and PETE/F plans for ABRFC are to be determined
- PETE/F for NERFC and NWRFC info was updated to reflect their continued use of the calibrated parameters in the SAC-SMA. During the discussion, CNRFC noted that the SAC-SMA method is what they will continue to use.

In summary:

- QPE - NERFC and NWRFC plan use of MPE/DQC, with ABRFC and CNRFC using local apps P3 and MountainMapper/DQC.
- QTE - NERFC and NWRFC plan use of MPE/DQC, with CNRFC using MountainMapper/DQC and ABRFC plans TBD
- QPF and QTF - CNRFC will use their local app Specify and the other three RFCs will use GFE.
- FLE/FLF – NERFC and NWRFC plan use of MPE/DQC for FLE and GFE for FLF, although NERFC use of freezing level data is in question. ABRFC does not use freezing level data and CNRFC will use MountainMapper's DailyQC and Specify in conjunction with the RSNWELEV operation.

Now that this initial information was collected and documented, NWRFC wondered what other work remains to be completed by this team. Mark responded that there was much work still to complete and there was follow-up discussion about the team activities, which is discussed at the end of the minutes.

The matrix information presents this same summary information, but in spreadsheet form. (This spreadsheet will be expanded in the future to describe the form of the gridded data being generated, as discussed below.)

2. Discussed recent NWRFC-Deltares communication on FEWS data ingest and processing capabilities.

On Tuesday, Dec 2, NWRFC/Joel and Deltares/Micha exchanged emails about the abilities of FEWS to handle different forms of gridded data that this forcing team will provide. The actual email exchange was posted on the chps_migration list server by Joe. As Joe discussed during the call, the feedback from Deltares is very positive as they stated that they already do or will be able to handle grids of almost any form – with varying spatial resolution, projection, and format.

I will attempt to summarize here: External input grids are ingested and converted into the FEWS generic, internal storage form used for time series data, which is then available for FEWS operations. Deltares can already ingest GRIB1, and they have examples of both netCDF and NHDF5, although those latter two formats require further coordination to establish a standard import module. Coordination and adjustments of FEWS software will be needed to support polar stereographic, which is expected to be used for MPE products. Grids for observed and forecast need not be the same form, nor is this expected for different physical elements, as these are transformed upon ingest. Once posted internally, various generic operations are available for further processing such as adding grids.

3. Discussed Software Support Role Of OHD/HSEB And RFC Tasks

In order to further explain the team, Mark discussed the probable roles of OHD and RFCs, as summarized below. More discussion is given as a follow-up to the meeting minutes.

In general, OHD Software Support consists of:

a) Support implementation MPE/DailyQC at RFCs; make software changes as necessary
b) Provide means for proper encoding of data into form usable by CHPS (There was discussion whether this is necessary in light of the FEWS capabilities – this issue is discussed further below)
c) Provide solution to temperature assimilation processor in the absence of the MAT preprocessor
d) other TBD

Specifically OHD/HSEB will actively work with NERFC and NWRFC to support their establishment of operations using MPE/DQC for QPE purposes and QTE purposes.

In general, RFC Activities include:

a) begin/continue efforts to produce gridded forcings
    a. continue configuration of GFE (for QPF, QTF, FLF)
    b. continue implementation of MPE-DQC (for QPE, QTE, FLE)
b) ensure local methods okay without OFS preprocessors (QPE, QTE)
c) work with OHD to identify functional holes from retired preprocessors
d) other TBD

General Team Direction/Thoughts:

This section discusses general team activities, ranging from the short-term to the long-term.

Central Team Goal: ensure that all "forcing" data needed for CHPS is available for BOC. The general approach for reaching this goal was outlined in the agenda/minutes of the team kickoff meeting. [A given forcing is defined by the combination of the hydrometeorological element (i.e. precipitation, temperature, freezing level, potential evapotranspiration) and the time domain (i.e. observed, forecast).]

Team Roles: As team leader I am not dictating a solution for each RFC on how they provide a grid for each forcing they need for their operations. Rather, I will help identify what grids FEWS can accept and coordinate with the RFCs how they plan to provide those grids. In part, this involves me being a "box-checker" and tracking each RFC's status as to whether they have properly considered their needs,

planned a solution, and are able to generate grids. Furthermore, I need to track and verify that the generated grids must be ingest-able by FEWS and render model results which are compatible with model results using pre-CHPS forcing methods or are otherwise compatible. Another part of the OHD role which I lead is to assist RFCs in developing their solution using baseline applications, whether that involves direct support of MPE or some coordination support for GFE usage. It may also involve some additional script or procedures support yet to be identified.

Next Phase of Team: involves identification the desired grid form for each forcing. I truly hope that for a given forcing, all RFCs will use the same form. There clearly are benefits in having conformance in this respect, regardless of whether FEWS can accept or be modified to accept any grid. Although it is probably not possible or practical, ideally the observed and forecast grids for a given element will be identical or similar, if only for verification purposes.

Grid Forms: Recent discussions with HQ staff indicate that GRIB1 will still be used in the AWIPS-2 era, but netCDF as used today will be replaced by HDF5. Also, HDF5 in AWIPS-2 will *not* be used as a transmission format; for at least a few years, it will only be used internally. The team's desired grid forms will need to coordinated with Deltares. Sample grids will be needed for basic testing, even before the full end-to-end test is peformed.

Related Teams: There are other NWS teams currently being considered for creation which would look at the overall NWS precipitation data operations. Currently, these data are sent in different forms to different destinations for different purposes, etc. and it is not efficient. A secondary goal of this team is to coordinate its activities w.r.t. precipitation with any other teams or needs to try and increase efficiency, reduce RFC workload, and make the RFC products more widely available.

Summary: This team's major tasks will not be considered complete until each RFC has demonstrated they can produce the gridded forcings and that they are usable and produce satisfactory results within CHPS. We are nowhere near that at this moment, so I feel that we have plenty of work to do, as a team.

Other Notes/Actions:

1) ESP Forcings: OHD/HSMB-DaveK provided feedback on the usage of forcings data by ESP, for which NWRFC noted that they use 10-days of forecast forcings data, using single deterministic time series, during initial period, before climatology forcings data are used.

   Davek noted: "If … the present forecast process for that time interval requires converting point forecasts directly to FMAT and FMAP, then there's some work that needs to be done to get grids from the point forecasts. … in most cases the forecast input is already in gridded form, or folks already use GFE or some application to create grids from point forecasts."

   This is still an area that needs more investigation and discussion.

2) Temperature Data: There has been discussion on the type of temperature grids to produce – namely, whether hourly instantaneous grids should be produced and/or whether 6-hour mean or max/min duration data should be produced. [Folks – please correct me on this subject as I may be misstating details – e.g. how does this discussion differ for observed vs. forecast data]

   Some folks mentioned concerns regarding the scientific validity of the models making proper use of hourly data. Some folks wondered what FEWS can do with respect to deriving necessary temperature information for model use.

   Mark will determine what the FEWS operations require in terms of the form of temperature data. This will possibly depend on the HSEB implementation of these operations and their interaction with the FEWS-provided functions.

DaveK provided the following guidance on temperature usage: “The OFS preprocessor and the NDFD2RFS application have ways to treat max/min temperature data to estimate 6-h averages. Over the last few years some fixes (maybe just ATANs) have been installed to make the OFS preprocessor use a diurnal temperature cycle particular to the RFC and season. So that statistical tool already exists. Using hourly or 3-hourly temperatures is much cleaner, in that assumptions about diurnal temperature cycle aren't really needed (according to our findings).”

More discussion of this topic is still necessary.

3) PET Information: DaveK noted “For PE (forecast and antecedent) we do have to find out how people were getting the SAC-SMA "climatic" values for basins and zones. Whatever the source, those will have to be gridded and some processor developed to get the climatic values interpolated to the current day.”

   I am not sure that we will need to provide any grids for PET, as the current info embedded within the calibration is expected to be available. I need to confirm that this info is indeed preserved within the migrated SAC-SMA calibration data migrated into CHPS.